Influencing factors of horizontal leaders' role identity in projects: A sequential mixed method approach

Fangwei Zhu [a], Linzhuo Wang [a], Mouxuan Sun [a,*], Xiuxia Sun [a], Ralf Müller [b]

[a] Dalian University of Technology, Faculty of Management and Economics, No.2 Linggong Road, Ganjingzi District, Dalian, China
[b] BI Norwegian Business School, Nydalsveien 37, 0484 Oslo, Norwa, Sjöbogatan 10, 212 28 Malmö, Sweden

Abstract

Horizontal leadership is temporary and often short-term compared with vertical leadership. Therefore, the role identity of horizontal leaders' is more difficult to be legitimated. In this study, we investigated how different factors interact and work in concert to influence horizontal leaders' role identity (hereafter, HLs' role identity). A sequential mixed method approach was chosen to conduct this research. Twenty-four interviews were analysed, and we identified eleven influencing factors associated with HLs' role identity. Subsequently, a sample of 150 questionnaires was analysed by using fuzzy-set qualitative comparative analysis (fsQCA) to ascertain the collective effect of different influencing factors on HLs' strong and weak role identities. The results showed that high job complexity, intrinsic rewards, self-efficacy and personal expectations were the necessary conditions for HLs' strong role identity. The lack of expectations of other team members was the only necessary condition that resulted in HLs' weak role identity. Based on the 13 configurations of HLs' strong and weak role identities that were obtained from this research, we formed an HLs' role identity model. It was found that the expectations of other project team members together with empowerment by project managers are the most common and effective ways to establish HLs' strong role identity. Through a comparison, experienced and less experienced team members take different paths towards a strong or weak role identity. The theoretical and managerial implications are discussed.
© 2019 Elsevier Ltd, APM and IPMA. All rights reserved.

Keywords: Horizontal leadership; Role identity; Qualitative comparative analysis; Fuzzy-set

1. Introduction

During the past 100 years, leadership has been a fast-growing field in management research (Crevani et al., 2010). Various classic leadership theories have been developed, including situational leadership theory (Fieldler, 1964), transactional and transformational leadership theory (Bass, 1990), Leader-Member Exchange theory (Graen and Uhlbien, 1995), etc. Most of these leadership theories consider leadership to be "vertical" (Pearce and Sims, 2002). That is, leadership is exercised by a single person who is formally designated with leadership authority by the organization (Bass and Bass, 2008). The command and control are sent vertically from managers to subordinates. However, with the increasing use of teams in the workplace, researchers and practitioners started to realize that leadership is not necessarily tied to designated hierarchical positions. Therefore, theories of team-based leadership emerged, such as shared leadership (Pearce and Conger, 2003) and distributed leadership (Bolden, 2011). Both streams of literature, where shared leadership is people-centric and distributed leadership is team-centric, miss the interaction between vertical leadership and team-based leadership. As in projects, leadership is rarely executed solely by a project manager; in fact, leadership is also exercised by the team members who are most appropriate at any point in time to lead the project (Müller et al., 2017a, 2017b). This new leadership concept is referred to as "horizontal" leadership, which

* Corresponding author at: Dalian University of Technology, China, No.2 Linggong Road, Ganjingzi District, Dalian, China.
 E-mail addresses: zhufw@dlut.edu.cn (F. Zhu), sunmouxuan@mail.dlut.edu.cn (M. Sun).

means that one or a few project team members will become a temporary leader (or leaders) within the boundaries of the project, but they are still governed by a project manager (who is known as a vertical leader) (Pilkiene et al., 2018). Compared with vertical leadership, horizontal leadership is no longer leader-centred but team-centred. Studies have shown that leadership provided by team members can have a positive influence on teamwork results. It not only improves informal leaders' individual performance (Zhang et al., 2012) but also significantly contributes to team effectiveness (Friedrich et al., 2009; Nicolaides et al., 2014). Therefore, if a company/project manager wants to improve project performance, it may be appropriate to not only rely on a formal structure of leadership but also to fully use the leadership potential of team members (D'Innocenzo et al., 2016).

However, since horizontal leaders are not officially or formally appointed by authority through an organization's structure, the legitimacy of such a role (as horizontal leaders) is usually lower than vertical leaders within the organizational structure. Individuals are more likely to have negative emotions due to a lack of formality, which affects their role identity. Role identity is one's "imaginative view of himself as he likes to think of himself being and acting as an occupant" (McCall and Simmons, 1978, p65). As suggested by Callero et al. (1987), a strong role identity is a robust determinant of corresponding behaviours. Therefore, strong horizontal leaders' role identity (hereinafter, HLs' role identity) guides individuals to behave according to their role as horizontal leaders, which is most likely to be beneficial to the team. The research on leadership role identity also reveals that when individuals cannot match their role identities, they become less satisfied with their roles and tend to leave their groups (Riley and Burke, 1995), which may pose negative effects on the team. Therefore, it is important to study and analyse the influencing factors associated with HLs' role identity, which helps an understanding of why some team members have stronger role identities than other team members. Considering the above, the first research question that we address is as follows:

RQ1. What are the factors that influence HLs' role identity in projects?

Role identity is a complex result of activities, resources and meanings, which can be internal or external (Stryker and Burke, 2000). It has been investigated at different levels of analysis including the macro, *meso* and micro level (Stets and Cast, 2007). It is probably best to understand role identity as a combination of interconnected factors (Stryker and Burke, 2000). The majority of studies on role identity is quantitative, and they focus on estimating whether or not the "net effect" of each hypothesized independent variable associates significantly with a certain role identity, such as in Farmer et al. (2003) and Zhang and Bartol (2010). Although such correlation-based approaches are useful for examining the relative contribution of individual influencing factors, they face considerable challenges in modelling the ways in which the factors may combine rather than compete in causing the outcome of interest (Frambach et al., 2016). By contrast, a qualitative comparative analysis approach is uniquely suited to analyse this type of

complex configurational relationship because this approach explicitly focuses on the combinations of attributes and allows for a sophisticated analysis of complex causal relationships through configurations (Ragin, 2000, 2008). Therefore, our second research question is as follows:

RQ2. : What are the configurations of factors that associate with HLs' strong and weak role identities?

The unit of analysis in the present study is the individual project team member as a horizontal leader. This study takes the ontological stance of Critical Realism; therefore, it aims at explaining the phenomena rather than claiming that this explanation is the only possible one (Bhaskar, 2016). Consistent with the qualitative comparative analysis approach, configurational theory (Fiss et al., 2013) is used as the theoretical lens.

A sequential mixed method approach was applied for this study. We conducted 24 semi-structured interviews to explore the possible influencing factors of HLs' role identity in projects and to identify the potential causal relationships among different combinations of influencing factors and outcomes. We also conducted fuzzy-set qualitative comparative analysis (fsQCA) by using a data sample of 150 questionnaires. The configurations were grouped based on HLs' work experience and analysed to identify how different influencing factors interact, both individually and jointly with HLs' role identity.

This study offers a holistic understanding on the collective effect of influencing factors on HLs' role identity in projects. It is known that horizontal leadership can greatly improve both individual and team performance. Accordingly, we further reveal the configurations that lead to HLs' strong and weak role identity. These configurations serve as good references for practitioners to design environments for temporal leaders and to make it possible to strengthen their role identity or to intervene to overcome a weak role identity.

Academics benefit from a contribution to the emerging stream of literature on horizontal leadership. Our study is also an attempt to introduce fuzzy set qualitative comparative analysis – a data analysis technique that identifies the combinations of influencing factors that cause the particular outcomes (Bell et al., 2014) – into the field of leadership research in a project context. Accordingly, we re-examine role identity theory by simultaneously considering the influences from various processes and different levels of analysis.

This paper is structured as follows. In Section 2, the existing literature and previous research are discussed, and they explain the theoretical framework of this research. Section 3 discusses the research methods. The results and analyses are provided in Section 4. Section 5 presents a discussion of the results. The final section of this paper is the conclusion, wherein the two research questions are answered as part of the discussion.

2. Literature review

This section outlines the main concepts that formed the framework of the research. The literature on horizontal leadership in projects is first reviewed in Section 2.1, followed by a review of role identity and its influencing factors in

Section 2.2. Section 2.3 focuses on the theoretical framework that underlies this study.

2.1. Horizontal leadership in projects

The realm of leadership studies has traditionally been leader-centred, and it focuses on individual leaders' traits, abilities and behaviours (Wood, 2005). It has conceptualized the group structure as stable and the leadership structure as fixed (DeRue et al., 2015). However, in the context of projects, leadership is no longer treated as "a fixed group structure", and group members can also engage in leadership behaviours. Two types of leadership coexist in the project context (shown in Fig. 1), namely, vertical leadership and horizontal leadership. Vertical leadership is a traditional leader-centred, top-down type of leadership provided by project managers to influence their team members to carry the project forward (Pearce, 2004). In contrast, horizontal leadership is a dynamic and temporary type of leadership provided by one or a few project team members under the governance of a project manager to accomplish the project results (Müller et al., 2017a, 2017b). Scenarios of horizontal leadership include, for example, when a technical issue arises, and the project manager is no longer the best person for decision making, one or some of the specialists from the team who have critical skills and knowledge are empowered by the project manager to lead the team temporarily. Another example is when a project manager leads multiple projects simultaneously and he or she has to rely on one or several team members who are identified in-advance to carry the projects forward for a while. Therefore, leadership in a project context is no longer stable or fixed but moves dynamically among project managers and project team members. Such flexibility increases a project team's capacity of handling a wider range of situations and tasks (Crevani et al., 2007). Horizontal leaders are typically identified and temporarily empowered by project managers; however, they are not officially appointed upfront by the wider organization. Therefore, they often do not lead with the same level of official authority as formally appointed leaders but have to influence the team indirectly through their personality traits and individual performance (Paunova, 2015). Therefore, compared with vertical leadership, horizontal leadership is relatively informal and temporary.

Consistent with a global trend towards more projectified ways of working (Lundin et al., 2015), projects and project teams have become increasingly common at the workplace. As a consequence, growing attention has been paid to horizontal leadership in the recent project management literature. Since horizontal leadership is viewed as a team-based collective phenomenon, most of the existing research on this topic has focused on the team level of analysis (Serban and Roberts, 2016), which is from a management point of view and is centred at the macro level. These studies have proven that horizontal leadership has a positive effect on team performance and effectiveness (Wang et al., 2014; Zhang et al., 2012), team creativity (Lee et al., 2015; Wu and Cormican, 2016) and innovative behaviours (Hoch, 2013). Apart from the outcomes of horizontal leadership, scholars have also examined the antecedents for the emergence of informal leaders in teams (DeRue et al., 2015; Serban and Roberts, 2016) and recommended how to maintain a good balance between these two types of leadership in teams (Müller et al., 2017a, 2017b). Only a very few studies use a horizontal leader as the unit of analysis, which is at a micro level. Considering these studies, there are still a number of questions to be explored, such as whether horizontal leaders understand and accept their specific roles or the research questions outlined before. It is clear that the existing research as discussed above does not answer the research questions proposed in the introduction section of this article.

This study is embedded in the *Theory Framework for Balanced Leadership*, which is an empirically developed cyclical model to examine the interactions between vertical and horizontal leadership (Müller et al., 2017a, 2017b). This cycle consists of five events, namely, 1) nomination, 2) identification, 3) selection, 4) horizontal leadership and governance, and 5) transition. This study focuses on the fourth event – horizontal leadership and governance – where team members can execute a leadership task under the governance of a project manager.

In the next section, we briefly review the concept of role identity and its influencing factors.

2.2. Role identity and its influencing factors

A role identity is a self-view or a meaning attributed to oneself in relation to a specific role (Burke, 1991) that is
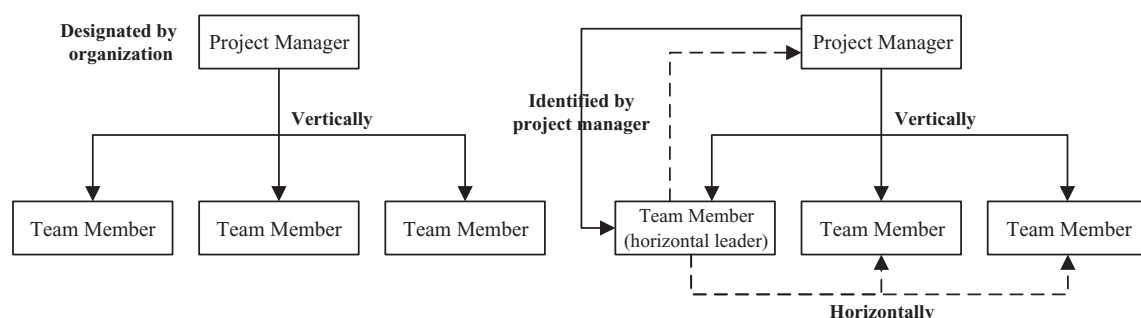

Fig. 1. Vertical leadership versus horizontal leadership.

generated reflexively through one's perceived appearance to one's self or other people, self-judgement of that appearance, and affect based on that judgement (McCall and Simmons, 1978). When an individual closely links his or her sense of self or identity to a specific role, this individual tends to behave according to this role identity (Callero et al., 1987) to gain the verification of such an identity (Burke and Stets, 2009; Petkus, 1996).

Role identity theory has evolved in two directions (Stryker and Burke, 2000). The first aspect is represented by the work of Stryker (1980) who believes that society is constructed of patterns of interactions and relationships. People live in small networks of social relationships by playing roles that support their membership, and these networks are embedded in larger social structures (Burke and Stets, 2009). Stryker's identity theory focuses on investigating how social structures, which comprise large, intermediate and proximate structures (Stryker et al., 2005), affect the self and one's identity salience. Once an identity is salient, people behave in ways consistent with the meanings attached to this identity (Serpe and Stryker, 2011; Stryker, 2008). The second aspect is represented by the work of Burke (1991) who conceptualizes the identity process as a cybernetic feedback loop that consists of four basic components, specifically an input, an identity standard, a comparator and an output. Burke's work is built on the assumption that people hold an internalized set of meanings. These meanings connect to each of their identities and guide their acts and behaviours so that other people view them in a way that is consistent with these meanings. Compared with Stryker's identity theory, which emphasises the external, social structural sources of identity and the salience of identity, Burke's work

focuses more on the internal, cognitive identity process and dynamics. These two views also represent two research levels in the role identity research, namely, the social structures level and individual dynamics level (Burke and Stets, 2009). It is clear that the social structures level is external and that the individual dynamics level is internal (Stryker and Burke, 2000).

To study HLs' role identity, we need to identify the influencing factors that play parts in the role identity process. Therefore, a systematic selection and review of the extant role identity literature is needed. With the aim of ensuring the inclusiveness of the influencing factors, we followed the literature selecting steps offered by Pawson et al. (2005). We identified almost forty influencing factors at this stage. We also followed the two aspects of social structures and individual dynamics mentioned above to categorize these factors. In addition, the existing literature also revealed that some factors including resources such as education, occupation, income (Stets and Cast, 2007), job tenure, job complexity (Tierney and Farmer, 2002) and individuals' skills and performance (Stryker and Burke, 2000) seem to also contribute to role identity. However, it is difficult to classify these factors into any categories of social structures or individual dynamics; therefore, in this study, we classified them into a third category called "Context". The representative influencing factors of role identity that have been identified in the relevant literature are summarized and listed in Table 1.

By reviewing the literature, we found that the influencing factors are not completely isolated from one another. They are rather interactive and reciprocally embedded in one another. For example, Farmer et al. (2003) suggested that culture experienced psychologically has a direct effect on self-construal and the

Table 1
Representative influencing factors of role identity identified in the existing literature.

Category	Influencing factor	Author
Social structures	Institutional logic	Reay et al. (2017)
	Empowering leadership	Zhang and Bartol (2010)
	Extrinsic rewards, role support, expectations of other people	Siebert and Siebert (2007)
	Interpersonal resources (understood, accepted and trusted in relationships), verification from others	Stets and Cast (2007)
	Feedback, role model	Pratt et al. (2006)
	Co-worker expectations, culture	Farmer et al. (2003)
	Status, respect, esteem	Stryker and Burke (2000)
	Training	Blau (1999)
	Socialization practices, role modelling	Ibarra (1999)
	Commitment	Stryker (1980)
	Support, commitment, reward	McCall and Simmons (1978)
Individual dynamics	Distress, self-esteem	Burke and Stets (2009)
	Personal role expectation, intrinsic rewards	Siebert and Siebert (2007)
	Personal resources (self-worth and self-efficacy)	Stets and Cast (2007)
	Self-view of behaviour	Farmer et al. (2003)
	Self-efficacy	Tierney and Farmer (2002)
	Religious role expectations	Weaver and Agle (2002)
	Self-conceptions, past experiences	Ibarra (1999)
	Support (self-support and experience support), intrinsic rewards	McCall and Simmons (1978)
Context	Professional education	Siebert and Siebert (2007)
	Structural resources such as education, occupation and income	Stets and Cast (2007)
	Job tenure, job complexity	Tierney and Farmer (2002)
	Skills, performance	Stryker and Burke (2000)
	Job requirements	Ibarra (1999)

atmosphere provided by the organization that affirms the self-view of certain behaviours. Stryker and Burke (2000) pointed out that role identity implies a duality; therefore, a role is external and tied to social positions within social structures, while identity is internal and consists of internalized meanings and personal expectations associated with a role. Accordingly, role identity is a process that combines with activities, resources and meanings that are mutually or sequentially controlled. Stryker and Burke (2000) called for scholars to design and conduct research that examines how commitments to the networks of social structures affect individuals' internal dynamics, and vice versa. Burke and Stets (2009) also recommended that the development of identity theory can be further enhanced and expanded by merging the macro, *meso* and micro level of analysis together in an attempt to better predict one's social behaviours. Researchers have identified some influencing factors, their interaction and their joint effect on role identity. However, in-depth investigations and analyses in this area have not been conducted.

2.3. The theoretical framework of this study

The theoretical framework of this study is derived from configurational theory (Fiss et al., 2013) and role identity theory (Stryker and Burke, 2000) to gain a deeper appreciation for the influencing factors of HLs' role identity in projects.

The notion of configuration, i.e., that the whole is best understood from a systematic perspective and should be viewed as a constellation of inter-connected elements, can be traced back to the writings of founding fathers such as Max Weber (Fiss et al., 2013). Configurational theory suggests a clean break from the predominant linear paradigm. A configurational approach assumes complex causality and nonlinear relationships rather than implying singular causation and linear relationships (Fiss, 2007). Qualitative Comparative Analysis (QCA) evolved from the configurational theory and provides researchers with a novel set of tools to disentangle complex causal relationships. QCA was originally used for comparative case studies in the field of sociology and was systematized, further developed and transformed by Charles C. Ragin (1987, 2000) into a coherent approach. QCA's three main characteristics of conjunctural causation, equifinality, and causal asymmetry (Schneider and Wagemann, 2012) motivate the choice to combine configurational theory with role identity theory as the theoretical framework.

First, QCA focuses on conjunctural causation, which foresees the effect of a single condition that unfolds only in combination with other precisely specified conditions. This focus is consistent with the characteristics of role identity, which is a complex process associated with various factors including activities, resources and meanings. Moreover, when conducting a multilevel or cross-level analysis, a traditional multilevel regression analysis requires researchers to control the effects of other levels to measure the "net effects" at a given level (Lacey and Fiss, 2009). On the contrary, QCA as a configurational approach is interested in the combined effects, which makes it particularly suitable for this study.

Second, in QCA, the assumption of equifinality allows for different, mutually non-exclusive explanations of the same phenomenon (Schneider and Wagemann, 2012). That is, each configuration is also a causal path that can lead to the same outcome. This feature suits the requirement of our research since role identity is also a phenomenon that can be explained in various ways (Stryker and Burke, 2000).

Third, the assumption of causal asymmetry implies that if A → B, then ~A → ~B is not necessarily true. In the role identity research area, a causal relationship between variables is asymmetrical in many cases. For example, in the study of creative role identity conducted by Farmer et al. (2003), they found that more extensive contact with U.S. culture was positively related to creative role identity. However, less extensive contact or even no contact with U.S. culture did not neðcessarily cause low creative role identity, since creative role identity can be positively influenced by other factors including co-worker role expectations or the self-view of past creative behaviours.

QCA overcomes the shortcomings of traditional multilevel regression analysis that assumes that influencing factors are independent from one another, neglecting the fact that role identity in nature is a complex process and various influencing factors are combined in this process. By contrast, QCA is uniquely suited for analysing these types of complex configurational relationships because this approach explicitly focuses on the combinations of different attributes. It also allows researchers to conduct a sophisticated analysis of complex causal relationships through configurations (Ragin, 2000, 2008).

3. Methodology

By following Saunders et al.'s (2007) research design process, we started with the determination of the ontological stance for the study. Critical Realism was chosen for several reasons, namely, the congruency with the researchers own ontology and Critical Realism's particular good fit for case study research. Based on Critical Realism, the researchers agreed on the existence of a particular experienced phenomenon (such as horizontal leadership) and then sought to explain this phenomenon while clearly knowing that there might be several possible explanations of the same experience/phenomenon (Bhaskar, 2016).

A sequential qualitative-quantitative mixed method approach was chosen (Saunders et al., 2007). In the first stage, we conducted 24 semi-structured interviews to identify the influencing factors associated with HLs' role identity. In the second stage, fuzzy-set QCA was deployed to systematically assess 150 questionnaires. When applying QCA, a distinction is often made between crisp sets, which are dichotomous in nature (in or out), or fuzzy-sets, which range from 0 to 1 and allow for a more fine-grained assessment of set membership. Fuzzy-sets can take different ranges across different sets in an analysis and help to identify the relationships between causal conditions and outcomes (for more details, please refer to Ragin (2008)). This method is particularly beneficial when causation is complex or when different conditions produce identical results (Fiss, 2007).

A feature of this two-stage approach is feedback (Donal, 2010), since the interview evidence serves to identify the influencing factors that are to be analysed in the second stage. The configurations obtained by fuzzy-set analysis can be explained by interview evidence and used to verify the causal conditions identified in the first stage.

3.1. Semi-structured interviews

Semi-structured interviews were chosen as a research strategy to identify the influencing factors associated with HLs' role identity. On the one hand, the sampling was conducted in China to avoid the effects of cultural differences. On the other hand, we also aimed at maximising the variation in the given culture by proposing to study the breadth of the phenomenon over several industries. By looking for variety in the sample to identify the most basic patterns across industries, the maximum of variation sampling helped to identify the key characteristics of the phenomenon (Teddlie and Yu, 2007),

As mentioned before, we conducted 24 interviews in China that covered a wide range of projects, interviewees from different projects, age spans, and work experience. We first approached project managers from each case company and asked them to provide a list of their project team members who worked as horizontal leaders in the projects during the past six months. We then randomly selected some horizontal leaders from the lists for interviews. All interviews were initially conducted in Chinese and then translated into English with the help of two native English speakers to ensure the truthfulness and accuracy of the translation. Among these 24 interviews, 15 of them were with team members who had experience working as horizontal leaders. The other nine interviews were with the project managers who used to work as horizontal leaders and could provide input from a management point of view. Their organizations are projectified in the sense of Midler (1995). The industries covered in this study include engineering and construction, finance, business services outsourcing, etc. Table 2 provides an overview of the 24 semi-structured interviews.

The interviews were based on informed consent and lasted between 30 and 60 min. The following three types of questions were asked during the interviews: a) general information about the interviewees, such as their roles and tenure; b) real case examples of horizontal leadership and their own experiences and feelings; and c) the possible influencing factors of HLs' role identity. The interviews were conducted by teams of two researchers; one researcher took notes and the other researcher led the discussion. All interviews were recorded, subsequently transcribed and then analysed by using NVivo 10. The analysis was conducted by using Miles et al.'s (2014) process of initial coding, followed by a second-cycle of coding for pattern identification. Thus, we followed a popular iterative cycle of data collection, data display, data reduction and conclusion finding. The analysis of these interviews yielded 47 codes extracted from the transcripts through coding. Since there were quite a few codes, we decided to omit the codes with fewer than three text units, and we retained 42 potential items for this frequency-based approach.

We then discussed the list of items with a focus group that consisted of ten project team members who had experience in working as horizontal leaders. The participants were asked to vote for the importance of each item regarding HLs' role identity. The item remained if more than half of the group agreed on it, and 18 items remained after this process. The group members then discussed the intended meaning of these 18 items. Two researchers reviewed the meanings and grouped similar definitions together. Finally, eleven influencing factors were obtained, including extrinsic rewards, intrinsic rewards, empowerment, training, support from the project manager, expectations of other team members, personal expectations, self-efficacy, job complexity, horizontal leadership culture and HLs' work experience. These eleven influencing factors were further classified into the three categories of social structures, individual dynamics, and context. These eleven influencing factors were defined with a reference to the existing literature on role identity and modification in the context of horizontal leadership. The definitions of the influencing factors are listed in Table 3:

Table 2
Overview of the 24 semi-structured interviews.

Company	Company 1	Company 2	Company 3	Company 4	Company 5
Industry	Engineering and Construction	Consulting	High-Tech	Natural Resources	Business Services Outsourcing
Employees	2000	800	1000	200	50
Scope of operations	International	International	National	Mainly national	International
Description	Specialising in coke-making and refractory-making plants	Scope covers audit, advisory and tax	Software development	Oil & gas engineering and manufacturing organization	Local branch of a US-headquartered IT corporation, specialising in business process outsourcing
Interviewees (total 24)	4	5	5	4	6
Project managers (9)	1	2	3	1	2
Project team members (15)	3	3	2	3	4

Table 3
Definitions of the eleven influencing factors.

Category	Influencing factor	Definition	Illustrative quotes	Reference
Social structures	Extrinsic rewards	Material rewards such as extra bonuses, monetary rewards or a salary increase	*He [project manager] promised that he would raise my year-end bonus after project delivery.*	Siebert and Siebert (2007)
	Expectations of other team members	Other team members' expectations about individuals being horizontal leaders	*My colleagues [other team members] were expecting someone who knows how to fix the problem to take the lead, and they know I am qualified.*	Farmer et al. (2003)
	Empowerment	When horizontal leaders' role is officially empowered or authorized by the project manager	*He [project manager] delegated his power to me for this "special mission" [being a horizontal leader].*	Zhang and Bartol (2010)
	Training	Training for particular work items that relate to horizontal leadership that is provided by the project manager, team or organization	*My project manager sat down with me and taught me how to deal with the functional departments in our company.*	Blau (1999)
	Horizontal leadership culture	Whether there is a horizontal leadership culture or atmosphere in the team or organization where the respondent works	*She [project manager] always encouraged us to take on extra responsibilities and take the lead in areas that we are good at.*	Farmer et al. (2003)
	Support from the project manager	How much support is provided to the horizontal leader by the project manager	*He said he would back me up and that I could always turn to him for help.*	McCall and Simmons (1978)
Individual dynamics	Intrinsic rewards	Measures how satisfied the respondent has been when working as a horizontal leader, including the feeling of "I am competent for this role" or "I am carrying the project forward"	*Being the lead for the team certainly gave me a sense of achievement. Carrying the entire team forward just feels great!*	McCall and Simmons (1978)
	Personal expectations	A respondent's own expectations on their performance outcome and image outcome while working as a horizontal leader	*This role [horizontal leader] gave me more exposure in the company. I knew this could be an opportunity.*	Siebert and Siebert (2007)
	Self-efficacy	HLs' "beliefs" on their own capabilities of mobilizing the motivation, cognitive resources and courses of action needed to work successfully as horizontal leaders	*Leading teams is my strength. I have strong communication and coordination skills. I wasn't surprised that I did a good job.*	Tierney and Farmer (2002)
Context	Job complexity	The complexity (or difficulty) of the tasks and assignments faced by individuals when working as horizontal leaders	*In this project, different functional departments needed to be coordinated. This was extremely demanding especially when we kept running into different problems...I can tell you, it's never easy to lead a project team.*	Tierney and Farmer (2002)
	Work experience	Respondent's tenure when working as a horizontal leader	*I have been working in this business for over 20 years, I have seen different strange things. Experience in fact helps you to lead the team.*	Tierney and Farmer (2002)

3.2. Fuzzy-set QCA

3.2.1. Data collection

We used a list of corporations and firms with good project management performance in China to develop the sample frame for this study. Project team members who worked as horizontal leaders in the past two years were potential respondents targeted to answer our questionnaire either electronically or physically. We gathered 150 valid answers (92% response rate), including 109 online questionnaires and 41 paper-based questionnaires. Table 4 shows the demographics of the 150 respondents.

3.2.2. Measurement

HLs' role identity was captured through Callero's (1985) role identity scale, which measures the extent to which the role of horizontal leaders has been incorporated into self-identity. This well validated five-item scale uses the five-point Likert scaling for the responses. We modified the items' wording to reflect the centrality of role identity as a horizontal leader. A Cronbach's alpha of 0.694 indicated the reliability of the construct.

Among these eleven influencing factors, *extrinsic rewards*, *training* and *empowerment* are dichotomous and can be measured by "Yes" or "No". Work experience was measured

as the respondents' tenure when they worked as a horizontal leader.

The measurement of the remaining seven conditions followed well-validated scales in the existing research. Several items had modifications based on the horizontal leadership context. The measurement of all items used five-point Likert scales, from 1 = totally disagree to 5 = totally agree. The details of the measurements are as follows.

Intrinsic rewards (alpha = 0.685), which concern how satisfied the respondent was when working as a horizontal leader, were measured with the four-item scale developed by Thomas (2009). Example items are "When I work as the horizontal leader, I can feel I am doing good, high-quality work" and "When I work as the horizontal leader, I can feel my work is moving forward".

Horizontal leadership culture (alpha = 0.727) used a two-item self-constructed scale to measure whether the team or organization where the respondent worked has a horizontal leadership culture. One of the example items is "There is a horizontal leadership culture in my project team, and my project manager supports me as the horizontal leader".

Support from the project manager (alpha = 0.815) was measured by an adaptive version of the manager support scale developed by Tymon et al. (2010). Some example items are "My project manager leads by example" and "My project manager gives me the support I need to work well as the horizontal leader".

Expectations of other team members (alpha = 0.795) were measured by an adaptive version of six items from the others' expectations scale developed by Callero (1985). Some example items include "Many of my project team members think of me

in terms of being a horizontal leader" and "Many of my project team members expect me to continue as a horizontal leader".

For *personal expectations* (alpha = 0.815), as with prior work such as Yuan and Woodman (2010), the outcome expectation was assessed by three items modified from House and Dessler's (1974) outcome expectancy scale, and image gains were measured by two out of four items developed by Ashford et al. (1998).

Self-efficacy (alpha = 0.837) was measured by using the eight-item new general self-efficacy scale developed by Chen et al. (2001). Example items are "I will be able to achieve most of the goals that I have set for myself" and "When facing difficult tasks, I am certain that I will accomplish them".

Finally, for *job complexity* (alpha = 0.713), the three-item scales developed by Cammann et al. (1983) were adapted. Example items are "When I work as a horizontal leader, my job is very complex" and "When I work as a horizontal leader, my job requires a lot of skill".

3.2.3. Reliability

Although there is no special requirement for the number of samples in QCA, Rihoux and Ragin (2009, p28) suggested that "altogether, a good balance must be reached between the number of cases and the number of conditions. The ideal balance is not a purely numerical one and will most of the time be found by trial and error". Marx and Dusa (2011) developed benchmark tables for model specification (the number of conditions and the number of cases) to predict when crispy-set qualitative comparative analysis (csQCA) would generate contradictions. However, there has been no similar model developed for fuzzy-set QCA (fsQCA) thus far. Since csQCA can be considered to be a special form of fsQCA (Schneider and Wagemann, 2012), we referred to Marx and Dusa's (2011) model for verification. The benchmark table shows that when the number of conditions is eleven and the sample size is 139, the probability of generating results on random data is low (<10%). In this study, the questionnaire size reached 150, and the probability of generating results on random data was reduced to 5%; therefore, the accuracy of the analysis can be assured.

3.2.4. Calibration and solution generation

Calibrating the measures is the first step for fsQCA analysis, which is critical since the result strongly depends on the calibration (Ragin, 2008). In this study, calibration was performed by following the recommendations of Rihoux and Ragin (2009). The following three types of data had to be calibrated: 1) dichotomous data including extrinsic rewards, empowerment and training; 2) continuous data, such as work experience; and 3) scale data that included the rest of the seven conditions and the outcome. For the dichotomous data, 0 stands for "No", and 1 stands for "Yes". However, during the process of questionnaire collection, some respondents mentioned that they were unsure if there were any extrinsic rewards when working as horizontal leaders. After discussing this issue with these respondents, we believed that the result of "not sure of if there were any extrinsic rewards" was similar to the result of

Table 4
Sample characteristics.

Category	N	Percentage
Gender		
Male	101	67.3%
Female	49	32.7%
Age (years)		
<30	44	29.3%
30–35	54	36.0%
35–40	23	15.3%
>40	29	19.3%
Firm capital nature		
State holding	5	3.3%
State owned	94	62.7%
Joint venture	5	3.3%
Private	18	12.0%
Foreign funded	23	15.3%
Others	5	3.3%
Industry		
Information technology	12	8.0%
Construction and engineering	45	30.0%
Energy	28	18.7%
Education	5	3.3%
Industrial automation	12	8.0%
Financial	10	6.7%
Manufacturing	19	12.6%
Others	19	12.7%

"no extrinsic reward"; therefore, "Not sure" was calibrated as 0. The same calibration practice was also applied to empowerment and training. For the continuous data, namely, work experience, the direct method (Ragin, 2007) was employed. Three qualitative anchors were used to structure the calibration: the median (10 years) as the crossover point and values around 90% and 10% of the maximum possible value (38 years) to full membership and full non-membership, respectively. For the scale data, the linguistic form of the survey data allows for a direct translation into fuzzy sets, which helps us to capture these qualitative differences. A direct assignment method was used, and the Likert scales were transformed into fuzzy set membership scores: 1, 2, 3, 4, 5 (five-point scale) → 0, 0.2, 0.4, 0.8, 1 (fuzzy set membership) (Emmenegger et al., 2014).

After all measures were calibrated and transformed into sets, we examined the necessary conditions for the outcome by using the fsQCA 2.5 software package (Ragin and Davey, 2008). A condition becomes necessary if its consistency exceeds 0.9 during the necessity test. Necessary conditions are critically important (Dul, 2016), because when the outcome occurs, the necessary condition is always present. Without necessary conditions, the outcome cannot occur, and other conditions cannot compensate for this absence.

The final step was to generate solutions for the configurations of HLs' strong and weak role identity. The lowest acceptable consistency for solutions was set at 0.80, which is above the minimum recommended threshold of 0.75 proposed by Ragin (2006) and should create robust results (Fiss, 2011; Rihoux and Ragin, 2009). To filter the extreme cases that only occurred once in our questionnaire results, the minimum acceptable solution frequency was set at 2. After all thresholds were set up in fsQCA 2.5, the solutions were generated.

4. Results and analysis

4.1. Semi-structured interviews

As discussed in the methodology section, the analyses of the interview data revealed the eleven influencing factors of HLs' role identity. In addition, some key features associated with HLs' role identity were revealed from the interview evidence.

First, job complexity and individual dynamics factors including intrinsic rewards, self-efficacy and personal expectations were found to be critical for HLs' strong role identity. These four factors were mentioned by all 24 interviewees. For example, a senior engineer with 20 years of work experience in Company 1 stated that *When I was working as a horizontal leader, the task was challenging, and sometimes I had to make tough decisions for them [project manager and project management office]. But I felt pretty good about it, as I can help the team to solve difficult problems, which means I am still valuable to the company. Besides, this helps me to further develop my technical skills.* In contrast, a team member from Company 5 mentioned that *This [a strong role identity as horizontal leader] really depends on the task; if it's something challenging or meaningful, I will have a strong role identity as the temporary leader of the team. While if it's something*

routine or even boring, I just don't want to do it. There is no point in doing it if there is nothing in it for me! A young engineer from Company 4 stated that *You must like it to do it well…To me, being a horizontal leader gives me a good exposure in the company. Certainly, I will give my best try.*

Second, 13 (out of 24) interviewees stated that empowerment from the project manager and expectations of other team members were important for HLs' role identity. A project manager from Company 2 mentioned that *Usually, I will try to find a guy who has a good performance and personality and make him/her a horizontal leader. People usually have high expectations for this kind of person; then it will be relatively easier for him/her to lead the team. And also, most of the time, I will try to empower him/her to make sure everyone knows that this guy is leading on behalf of me. This works every time.* A project team member in Company 3 stated that *This really depends on my boss and my colleagues. If my boss authorizes me in the first place, and my other colleagues on the team feel comfortable about it, I will have a stronger role identity as the lead.* A senior software developer in Company 3 mentioned that *Once I was tasked to guide a group of young guys to debug the system…They had different ideas, and they never listened to me! This experience sucked; I would love to lead people who really listen to me.*

Third, the interviews revealed that junior and senior team members might have different paths that lead to a strong or weak role identity. A 28-year-old consultant with five years of work experience at Company 2 stated that *The opportunity of working as a horizontal leader is very important to me, even more important than a bonus! In our company, being identified as a horizontal leader is kind of a special assignment for young people. I know if I perform well on this assignment, the management will offer me further assignments, and maybe one day, I will be promoted to a real project manager. So, no matter how tough it is, I still see myself as the lead, and I give my best.* A senior engineer in Company 4 indicated that *"The support from the boss [project manager] is important. If my boss doesn't support me, I won't do it as I don't want him to lose face. […] Besides, expectations from others are equally important. You know, on our team, every team member specialises in certain areas. If others don't listen to me, I'll just shut my mouth and do my own job. I don't want to lose face either!"*

4.2. Fuzzy-set analysis

We followed the notation applied by Fiss (2011) and subsequent research. In their research, "•" represents the presence of a condition, "⊗" represents its absence, and a blank space indicates a "don't care" situation that a given condition can be either present or absent (i.e., it is not assumed to be causally related to the outcome). We added a new notion "★" to represent a necessary condition.

4.2.1. Configurations of HLs' strong role identity

Table 5 shows ten solutions sufficient to achieve HLs' strong role identity. According to the necessity test, the presence of

intrinsic rewards, self-efficacy, personal expectations and high job complexity were necessary to the outcome of HLs' strong role identity as their consistency all exceeded 0.9. With the presence of these four necessary conditions, the combinations of the other seven conditions with different statuses (presence, absence or don't care) could all possibly lead to the outcome of a strong role identity. However, the consistency and coverage of the solutions varied greatly across different configurations.

The coverage score measures the importance of individual configurations and indicates how many cases take this path to the outcome. However, this path can overlap with other configurations. The net coverage score indicates the proportion of membership in the outcome that is solely explained by the individual configuration. Regarding the overall coverage, the ten solutions accounted for 84.5% of membership in the outcomes; thus, this presents an acceptable fit. Furthermore, all configurations showed high consistency values between 0.92 and 0.99, with the overall solution consistency at 0.943, which indicates that all configurations were sufficient to explain the outcome of HLs' strong role identity (Ragin, 2008).

Based on the interview data, we grouped the ten solutions into the following three sub-groups based on the median of work experience (10 years) as the crossover point: 1) Solutions 1(a, b, c) for all horizontal leaders (which has nothing to do with how many years of work experience that horizontal leaders have); 2) Solutions 2(a, b, c, d) for senior horizontal leaders with >10 years of work experience; and 3) Solutions 3 (a, b, c) for junior horizontal leaders with work experience of <10 years.

Solutions 1a, 1b and 1c: This group applied to all horizontal leaders without the concern of the HLs' work experience, and it had the highest sum of net coverage (0.153) compared with the other two groups. This group is special as both empowerment and the expectations of other team members are present. This indicates that one's role identity as a horizontal leader would be strengthened once such a leading role is officially recognized through the project manager's empowerment. With the highest sum of net coverage among all three groups, this group is the most common causal path towards strong HLs' role identity, which is also consistent with the findings gathered from interviews.

Solutions 2a to 2d: These four configurations are common in the presence of support from the project manager. This finding can be explained by project team members with rich work experience (>10 years) who tend to have strong HLs' role identity when being supported by their project managers.

Solutions 3a to 3c: This group applied to the respondents with <10 years of work experience, and the sum of the net coverage for this group was merely 0.017, which indicates that these three configurations could be the significant phenomenon under rare or extreme cases. Although other team members' expectations and training were absent in all three solutions, young horizontal leaders were empowered or authorized by their project managers in configurations 3b and 3c. Even under the "adverse" circumstances mentioned above, this small group of junior project team members still had a strong role identity, which, in turn, confirms that the four necessary conditions are playing a critical role in the process of strong role identity.

4.2.2. Configurations of HLs' weak role identity

Table 6 shows the three solutions for HLs' weak role identity. We also followed the same notation of Table 5 for Table 6. The only difference is that "☆" indicates the absence of the necessary condition in Table 6.

The necessity test showed that when the outcome was HLs' weak role identity, the consistency of the absence of expectations of other team members exceeded 0.90 and became the only necessary condition for HLs' weak role

Table 5
Configurations for HLs' strong role identity.

Configuration	Solution									
	1a	1b	1c	2a	2b	2c	2d	3a	3b	3c
Context										
Work experience				•	•	•	•	⊗	⊗	⊗
Job complexity	★	★	★	★	★	★	★	★	★	★
Social Structure										
Extrinsic rewards		⊗	•		⊗	⊗	⊗	⊗	⊗	
Empowerment	•	•	•	•	•				•	•
Training		•	⊗		⊗	⊗		⊗	⊗	⊗
Horizontal leadership culture	•	•		•		•	•	⊗		⊗
Support from the project manager	•	•		•	•	•	•		⊗	⊗
Expectations of other team members	•	•	•		⊗		•	⊗	⊗	⊗
Individual dynamics										
Intrinsic rewards	★	★	★	★	★	★	★	★	★	★
Personal expectations	★	★	★	★	★	★	★	★	★	★
Self-efficacy	★	★	★	★	★	★	★	★	★	★
Consistency	0.972	0.997	0.977	0.950	0.946	0.971	0.989	0.927	0.976	0.950
Coverage	0.641	0.162	0.127	0.389	0.088	0.174	0.283	0.070	0.095	0.129
Net coverage	0.126	0.011	0.016	0.021	0.001	0.006	0.015	0.005	0.008	0.004
Overall solution consistency	0.943									
Overall solution coverage	0.845									

Table 6
Configurations for HLs' weak role identity.

Configuration	Solution 1	2	3
Context			
Work experience	•	⊗	
Job complexity		⊗	
Social Structure			
Extrinsic rewards		⊗	⊗
Empowerment			
Training		⊗	⊗
Horizontal leadership culture			
Support from the project manager			⊗
Expectations of other team members	☆	☆	☆
Individual dynamics			
Intrinsic rewards			
Personal expectations			
Self-efficacy			
Consistency	0.800	0.839	0.832
Coverage	0.703	0.271	0.344
Net coverage	0.328	0.008	0.005
Overall solution consistency	0.861		
Overall solution coverage	0.732		

identity. The consistency score for the overall solution was 0.861, which is greater than the threshold of 0.80, and the overall coverage was 0.732, which indicates that the overall causal paths explain 73.2% of the outcome. Solution 1 described the configuration for senior horizontal leaders (with >10 years of work experience), while Solution 2 applied to junior horizontal leaders (with <10 years of work experience); Solution 3 applied to all horizontal leaders with any length of work experience.

Solution 1: The net coverage score of this configuration was 0.328, which was the highest among all three solutions. Based on the interview results, this configuration described a scenario where a senior team member was acting as a horizontal leader but could not perceive the expectations of other team members.

Solution 2: This configuration was applicable to junior project team members. The scenario was a job of low complexity that did not require training and where no extrinsic rewards were provided. This configuration had the highest consistency score of 0.839 among all three solutions.

Solution 3: Both factors of the support from the project manager and the expectations of other team members were missing in this configuration. In fact, the horizontal leader was not recognized by the entire team. Additionally, there was no material reward as external motivation, and no training was provided. People might feel that they were doing a thankless job and wondered *"Why should I do this?"* and *"How should I do this?"*, which eventually would result in a weak role identity.

5. Discussion

An HLs' role identity model is first developed in Section 5.1 by synthesizing the results gained for both strong and weak role identities. This model is based on the patterns of 13 generated configurations to obtain a holistic understanding of which influencing factors critically impact HLs' role identity and how they impact it. The comparison of role identity between experienced and less experienced horizontal leaders is then discussed in Section 5.2.

5.1. HLs' role identity model

The HLs' role identity model, as shown in Fig. 2, describes the key factors of horizontal leaders to achieve a strong or weak role identity. In Fig. 2, the vertical axis indicates the status of HLs' role identity (strong or weak), and the horizontal axis indicates the level of work experience. The influencing factors of context, social structures and individual dynamics are demonstrated in four types of conditions, namely, presence necessary, presence, absence necessary and absence. The factors across the entire horizontal axis indicate their applicability to all horizontal leaders, whereas the factors across only half of the horizontal axis relate to HLs' work experience.

In the strong role identity quadrant, job complexity is necessary as the context factor. Intrinsic rewards, personal expectations and self-efficacy are necessary as individual dynamics factors. Our findings resonate with previous literature that indicates that a high complexity job can provide support and motivation to individuals (Deci et al., 1989), which further influences individuals' intrinsic rewards and personal expectations. In addition, the presence of self-efficacy indicates that if individuals believe that there is a good fit between their capabilities and their role, individuals' outcome can be maximized, which also indirectly influences HLs' personal expectations (Boon et al., 2011). It is noteworthy that Burke and Stets (2009) suggested that individuals with high self-efficacy tend to challenge more complex jobs; therefore, the interactions between self-efficacy and job complexity are reciprocal. Empowerment and the expectations of other team members are substantive factors for all horizontal leaders. This result is supported by previous studies on horizontal leadership that indicate that empowerment is an essential element of the horizontal leadership framework, which involves transferring leadership authority to horizontal leaders (Müller et al., 2017a, 2017b).

According to Fig. 2, there are no universal factors as context or individual dynamics in the weak role identity quadrant. In general, two groups of social structure factors are critical to horizontal leaders, specifically the absence of expectations of other team members as the necessary condition and the absence of extrinsic rewards, training and support from the project manager.

Expectation state theory (Berger, 1977) posits that expectations regarding team members' abilities to contribute to a task solution become self-fulfilling prophecies and form a basis for dominance or status differences within teams (Paunova, 2015). Status characteristics, which are greater general competences (e.g., education, performance, etc.) and specific skills in goal-oriented groups (Ridgeway, 2004), systematically affect the likelihood that some categories of people will emerge as leaders largely through and because of the higher expectations of other people. From the perspective of identity theory, people who view themselves as leaders want to get feedback from other project team members that they are perceived as leaders. If they
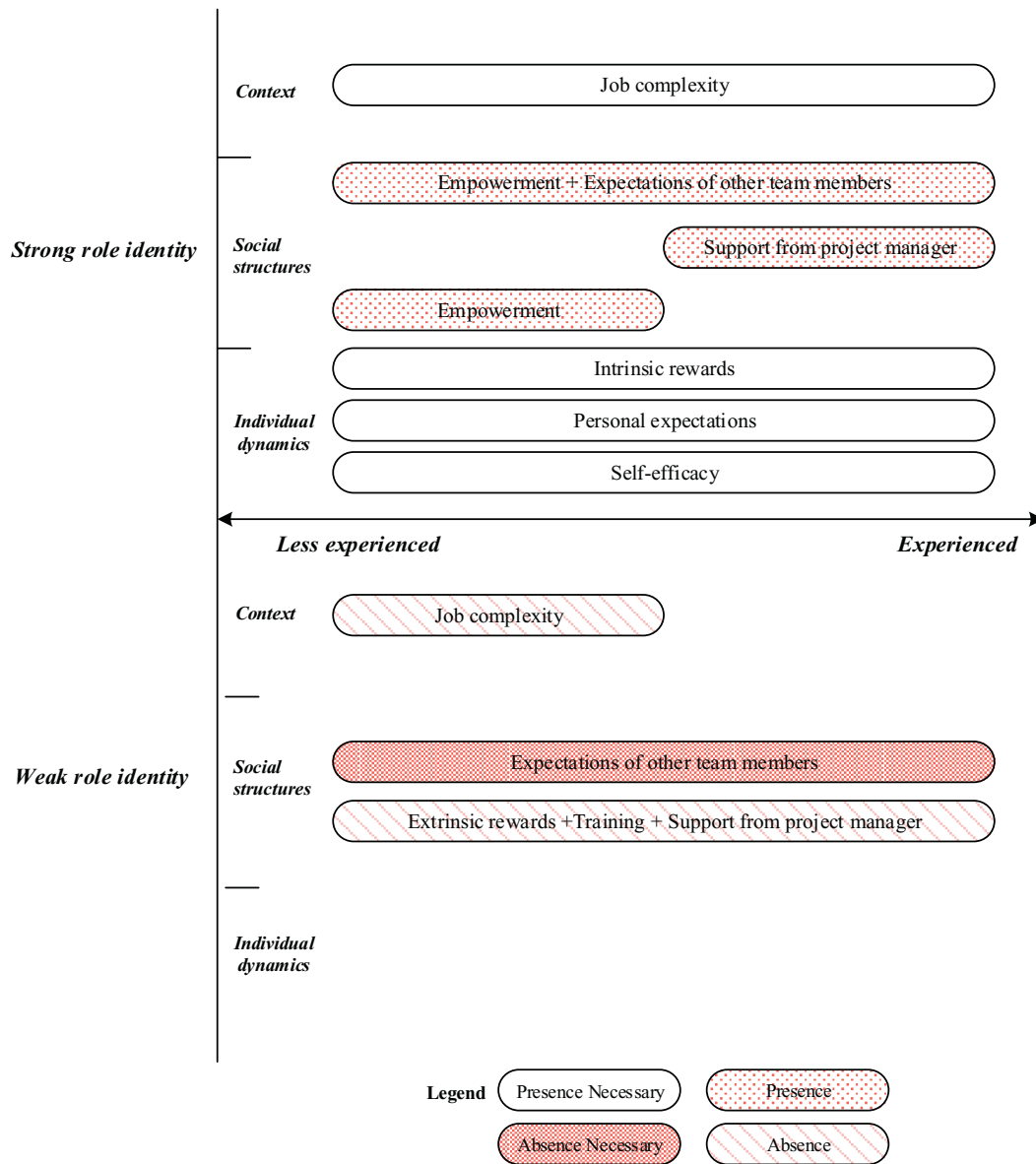
decisive role in HLs' weak role identity.

Fig. 2. HLs' role identity model.

do not feel the expectations of other team members, they become upset and suffer symptoms of stress (Stets and Burke, 2014; Zanna and Cooper, 1976). Moreover, with the expectations of other team members missing as the only necessary condition, combinations of other causal conditions are rather dispersed as shown in Table 6, which also indicates that the absence of the expectations of other team members plays a decisive role in HLs' weak role identity.

5.2. The comparison between the role identity of experienced and less experienced HLs

When categorizing the results of the data analysis, it was found that work experience becomes dominant. Horizontal

leaders with years of work experience are subject to support from their project managers, which resonates with Leadership-Member Exchange's decreasing effects on role ambiguity and role conflict (Dulebohn et al., 2012). Experienced horizontal leaders are impacted by perceived organizational support to a large extent (Wayne et al., 1997), and without the project manager's support, other types of influencing factors are less likely to boost role identity without the project manager's support. For an experienced horizontal leader, he or she is already the senior or expert on the team and might believe that he or she has the competency and influence to lead the team. However, when the situation does not happen in the way that it is "supposed to be", for example, if they could not get the right feedback from the team, horizontal leaders become upset or

distressed to varying degrees (Burke and Stets, 2009). If this situation continues, the horizontal leader will feel that he or she is "losing-face" or will have a low sense of presence on the team, which eventually leads to the result of a weak role identity. Only when under the strong support of project managers, along with the appearance of several other social structure factors, such as empowerment and a horizontal leadership culture (e.g., Solution 2 in Table 5), experienced horizontal leaders can build a strong role identity. However, their role identity is sensitive to the absence of the expectations of other project team members, and once the expectations are missing, experienced HLs' role identity will be impaired. Therefore, experienced HLs' role identity is "hard" to build and "easy" to break.

For less experienced horizontal leaders, empowerment is one of the positive factors that lead to a strong role identity, and the absence of job complexity, extrinsic rewards and training are the negative factors that may lead to a weak role identity. Under certain circumstances, once empowerment is available, no other factor is required (e.g., Solutions 3b and 3c in Table 5) to boost the role identity of less experienced horizontal leaders. This finding indicates the importance of empowerment as a critical step to facilitate HLs' behaviours in projects (Yu et al., 2018). However, the absence of job complexity, extrinsic rewards and training may demonstrate the lack of a cultivation of trust. A weak role identity is caused only when these factors are jointly absent. Therefore, for less experienced horizontal leaders, a strong role identity can be achieved with fewer social structure factors, and it will not be weakened very easily unless multiple factors are simultaneously absent. As a result, a strong role identity is "easy" to build and "hard" to break for less experienced horizontal leaders.

The comparisons above help to generate our findings, which are consistent with the role identity studies in other fields of research. Since the years of team members' work experience also increase along with their ages, what we measured as "years of experience" reflects "the general patterns of their ages". Our studies resonate with previous findings that age-related or experience threats are challenging factors for role identity, where the ageing process is regarded as an essential identity threat (Bisdee et al., 2013). Being a horizontal leader is a temporal position that raises new requirements for identity accommodation, which is defined as a process of changing identity in response to experience (Sneed and Whitbourne, 2003). Identity accommodation is negatively related to age, which is further explained by our findings that fewer influencing factors are required to decrease the role identity of experienced horizontal leaders. Compared with the senior team members in projects, young team members are more likely to hold a strong role identity without being affected by the external environment compared with senior team members. Based on the interview results, this can be understood as, for younger team members, an appointment to a temporary leadership role that sometimes implies that it is an assignment for a subsequent appointment to a formal project manager role in the future. Since being a horizontal leader carries extra meanings and provides more opportunities, which motivates

them to have a strong role identity, young team members tend to be freer from external disturbances.

Our findings are also consistent with Müller et al. (2017a, 2017b) unexpected finding of an age-gap preference between vertical and horizontal leaders. On the one hand, a vertical leader may want to avoid the "loss of face" by not appointing someone of equal seniority who may challenges his or her way of managing the project. On the other hand, to avoid potential embarrassment to their project manager, senior team members may only work as horizontal leaders and have a strong role identity when being supported by their project manager.

6. Conclusion

This research used a sequential mixed method approach to better understand the two research questions. In the first stage, which was based on 24 interviews, we identified the influencing factors associated with HLs' role identity. Eleven influencing factors were obtained, including extrinsic rewards, intrinsic rewards, empowerment, training, support from the project manager, expectations of other team members, personal expectations, self-efficacy, job complexity, horizontal leadership culture and HLs' work experience. These factors provided an answer to our *RQ1: What are the factors that influence HLs' role identity in projects?*

In the second stage, a fuzzy-set qualitative comparative analysis was deployed to assess all 150 questionnaires systematically. Ten solutions were derived from interpreting the configurations of HLs' strong role identity by using the fsQCA 2.5 software package. We then grouped the ten solutions based on the median of work experience (10 years) as a crossover point. Solutions 1a, 1b and 1c applied to all horizontal leaders regardless of their work experience. Solutions 2a to 2d described the configurations of senior horizontal leaders with >10 years of work experience. Solutions 3a, 3b and 3c applied to junior horizontal leaders with <10 years of work experience. The results are summarized in Table 5. Noteworthily, fsQCA 2.5 also generated three solutions of HLs' weak role identity. Solution 1 described the configuration for senior horizontal leaders, Solution 2 applied to junior horizontal leaders, and Solution 3 applied to all horizontal leaders. Table 6 provides the details of these three configurations. The results demonstrate that junior and senior team members may follow different paths that lead to different HLs' role identity (strong or weak). Accordingly, we answered *RQ2: What are the configurations of factors that associate with HLs' strong and weak role identities?*

Moreover, based on the detailed analyses of each configuration and the comparisons across different configurations, the interactions among the influencing factors were identified. Important findings of this research include the following. First, the presence of intrinsic rewards, self-efficacy, personal expectations and high job complexity are necessary conditions for HLs' strong role identity, while the absence of expectations of other team members is the only necessary condition for HLs' weak role identity. Informal leadership arises through the expectations of other project team members; once recognized

officially through empowerment from the project manager, is the most common and effective causal path to one's strong role identity as a horizontal leader. Such a combination, both informal and formal, works for all horizontal leaders. Second, the previously identified influencing factors help to form an HLs' role identity model. It is found that experienced and less experienced team members tend to take different paths that lead to a strong or weak role identity. Third, "face" is important for senior team members in projects when they act as horizontal leaders. With the support from their project managers, senior project team members usually tend to have a strong role identity as horizontal leaders. However, if they cannot perceive the expectations of their peers, they may tend to have a weak role identity as horizontal leaders. Lastly, young team members tend to be free from external disturbances, since being a horizontal leader may carry "extra meanings" and provide more opportunities, which motivate them to have a strong role identity as horizontal leaders. However, some junior team members can be bothered by low job complexity and the absence of extrinsic rewards and training.

6.1. Theoretical implications

The theoretical implications of this study are three-fold. First, by applying individual horizontal leaders as the unit of analysis, this study focuses on horizontal leadership and governance, which is the fourth event of the *Theory Framework for Balanced Leadership*. By combining our results with the empirical studies on the other events of this theory framework, we contribute to a larger theory on leadership in project management. Second, by conducting fsQCA, this study identifies various critical influencing factors and configurational paths for HLs' role identity. We expanded the boundaries of identity theory by simultaneously considering the macro, *meso* and micro level of analysis (Burke and Stets, 2009). Third, a comparison between experienced and less experienced horizontal leaders explores how junior and senior team members differ in the factors that lead to a strong or weak role identity. This comparison helps to enrich the previous understanding of age-related threats (Bisdee et al., 2013).

6.2. Managerial implications

The managerial implications of this research include the building of awareness among practitioners regarding the possible combinations of influencing factors that may have positive or negative impacts on HLs' role identity. Our results provide some references for project managers or project sponsors on how to specifically design a horizontal leadership environment for different project team members. The strategies suggested include the following. 1) Once horizontal leaders are identified, the project manager is recommended to empower them in a timely manner to enhance the legitimacy of their roles, which will help them to feel that this special role as horizontal leaders is proper, appropriate and justifiable. It is noteworthy that the project manager's empowerment is effective regardless of HLs' work experience, which means

that it works for all horizontal leaders. 2) Experienced and less experienced team members seem to take different paths towards a strong or weak role identity; therefore, they need to be managed differently. Project managers should pay more attention to experienced horizontal leaders, because senior team members' role identity as horizontal leaders is "hard" to build and "easy" to break. They are subject to the support of their project managers and sensitive to the absence of the expectations of other team members. To address this problem, project managers are recommended to provide sufficient support to experienced horizontal leaders and if necessary, to guide other project team members to follow experienced HLs' lead. In this way, the role identity of experienced HLs' is maintained at a high level. 3) In contrast, the role identity of junior project team members as temporary leaders is not usually a concern for project managers. Being a horizontal leader carries extra meanings for junior team members, since their appointments to take a temporary leadership role as horizontal leaders often result in a subsequent appointment to their first formal role of project manager. Therefore, compared with senior team members, a strong role identity of junior HLs' can be achieved with fewer social structure factors involved, and their strong role identity is not easily weakened unless multiple factors are simultaneously absent. However, the empowerment of project managers is still critical for younger horizontal leaders.

6.3. Strengths, limitations and future research

The strength of the present study is its sequential mixed method approach, which forms a loop between two research stages. The interview evidence gathered in the first stage of the research identifies the influencing factors that should be analysed in the second stage of the research. The configurations obtained from fuzzy-set qualitative comparative analysis can be explained by the interview evidence and used to validate the causal conditions identified in the first stage of the research. This study also has some limitations. Solution 3a is a configuration for a strong role identity, and Solutions 2 and 3 are configurations for a weak role identity with similar patterns. However, the outcomes of these three solutions are totally different. Nevertheless, the net coverage of each configuration is very low, which indicates that they are equivalent to extreme and rare cases of case study research (Eisenhardt and Graebner, 2007). It is worthy to explore the fact that this "similar antecedents but different outcomes" phenomenon results from the limitations of the QCA method or factors other than the eleven factors examined in this study. There is no doubt that some influencing factors are missing in this research or that there are even some influencing factors in the existing body of knowledge that we failed to discover. Another possible limitation is that our research results are based on data obtained only in a Chinese context. However, some of our samples cover large organizations that have headquarters worldwide, and their corporate culture may largely be dominated by their headquarters' culture. Therefore, the influence of the Chinese context is minimized by selecting both national and international

companies, and no apparent differences were discovered between western organizations and Chinese organizations during the interviews. Future research should qualitatively investigate the cases with "similar antecedents but different outcomes" to improve the QCA method or to discover other influencing factors in role identity theory. For future research, researchers can also conduct an in-depth case study to specifically address the differences between western and eastern cultures concerning HLs' role identity.

Finally, the research on horizontal and balanced leadership has already established a theoretical basis in the form of a framework that consists of five events, and each event has been carefully investigated by using dedicated studies. This provides new insight by identifying a space between shared/distributed (which emerges from the project team) and vertical leadership (which emerges from the project manager) as a new form of leadership in projects that is commonly practised but still unknown. Therefore, one of the research's contributions to knowledge is to extend management theory into a newly identified space by being the first study that addresses these questions of HLs' role identity. Future studies in this newly identified area can be further developed by examining questions such as the nature of the psychological contract between horizontal and vertical leaders, the psychological ownership of the leadership tasks, the project tasks, and/or the project per se during times of horizontal leadership, or the sense-making of horizontal and vertical leaders and team members during times of horizontal leadership. The results gathered from these future studies will provide some knowledge between the relevant theories derived from the research on permanent organizations and the empirical findings on temporary organizations. Previous studies of horizontal leadership have shown the existence of differences, such as the differences described by Yu et al. (2018), the differences among team maturity theories by Hersey and Blanchard (1988) or Hackman (1987) and their substitutes through horizontal leadership approaches in temporary settings, i.e., projects. Accordingly, future studies can provide some general understanding on the specifics of leadership in temporary organizations by focusing particularly on the context of horizontal leadership.

Acknowledgements

References

Ashford, S.J., Rothbard, N.P., Piderit, S.K., Dutton, J.E., 1998. Out on a limb: the role of context and impression Management in Selling Gender-Equity Issues. Adm. Sci. Q. 43 (1), 23.

Bass, B.M., 1990. From transactional to transformational leadership: learning to share the vision. Organ. Dyn. 18 (3), 19–31.

Bass, B.M., Bass, R., 2008. The Bass Handbook of Leadership: Theory, Research, and Managerial Applications. Free Press, New York, NY.

Bell, R.G., Filatotchev, I., Aguilera, R.V., 2014. Corporate governance and Investors' perceptions of foreign Ipo value: an institutional perspective. Acad. Manag. J. 57 (1), 301–320.

Berger, J.E., 1977. Status Characteristics and Social Interaction : An Expectation-States Approach. Elsevier Scientific Pub. Co., New York, New York.

Bhaskar, R., 2016. Enlightened Common Sense: The Philosophy of Critical Realism. Abingdon, Oxon, UK, Routledge, UK.

Bisdee, D., Price, D., Daly, T., 2013. Coping with age-related threats to role identity: older couples and the Management of Household Money. J. Community Appl. Soc. Psychol. 23 (6), 505–518.

Blanchard, K.H., 1988. Management of Organizational Behaviour. Prentice Hall, Englewood Cliffs, NJ.

Blau, G., 1999. Early-career job factors influencing the professional commitment of medical technologists. Acad. Manag. J. 42 (6), 687–695.

Bolden, R., 2011. Distributed leadership in organizations: a review of theory and research. Int. J. Manag. Rev. 13 (3SI), 251–269.

Boon, C., Den Hartog, D.N., Boselie, P., Paauwe, J., 2011. The relationship between perceptions of Hr practices and employee outcomes: examining the role of person-organisation and person-job fit. Int. J. Hum. Resour. Manag. 22 (1), 138–162.

Burke, P.J., 1991. Identity processes and social stress. Am. Sociol. Rev. 56 (6), 836–849.

Burke, P.J., Stets, J.E., 2009. Identity Theory. Oxford University Press, US.

Callero, P.L., 1985. Role-identity salience. Soc. Psychol. Q. 48 (3), 203–215.

Callero, P.L., HOWARD, J.A., PILIAVIN, J.A., 1987. Helping-behavior as role-behavior - disclosing social-structure and history in the analysis of pro-social action. Soc. Psychol. Q. 50 (3), 247–256.

Cammann, C., Fishman, M., Jenkins, G.J., Klesh, J.R., 1983. Assessing the Attitudes and Perceptions of Organizational Members, Assessing organizational change: A Guide to Methods, Measures, and Practices. Wiley, New York.

Chen, G., Gully, S.M., Eden, D., 2001. Validation of a new general self-efficacy scale. Organ. Res. Methods 4 (1), 62–83.

Crevani, L., Lindgren, M., Packendorff, J., 2007. Shared leadership: a post-heroic perspective on leadership as a collective construction. Int. J. Leadership Stud. 3 (1), 40–67.

Crevani, L., Lindgren, M., Packendorff, J., 2010. Leadership, not leaders: on the study of leadership as practices and interactions. Scand. J. Manag. 26 (1), 77–86.

Deci, E.L., Connell, J.P., Ryan, R.M., 1989. Self-determination in a work organization. J. Appl. Psychol. 74 (4), 580–590.

DeRue, D.S., Nahrgang, J.D., Ashford, S.J., 2015. Interpersonal perceptions and the emergence of leadership structures in groups: a network perspective. Organ. Sci. 26 (4), 1192–1209.

D'Innocenzo, L., Mathieu, J.E., Kukenberger, M.R., 2016. A meta-analysis of different forms of shared leadership–team performance relations. J. Manag. 42 (7), 1964–1991.

Donal, C., 2010. Predicting stakeholder orientation in the multinational Enterprise: a mid-range theory. J. Int. Bus. Stud. 42 (5), 694.

Dul, J., 2016. Identifying single necessary conditions with Nca and Fsqca. J. Bus. Res. 69 (4), 1516–1523.

Dulebohn, J., Bommer, W., Liden, R., Brouer, R., Ferris, G., 2012. A meta-analysis of antecedents and consequences of leader-member exchange: integrating the past with an eye toward the future. J. Manag. 38 (6), 1715–1759.

Eisenhardt, K.M., Graebner, M.E., 2007. Theory building from cases: opportunities and challenges. Acad. Manag. J. 50 (1), 25–32.

Emmenegger, P., Schraff, D., Walter, A., 2014. Qca, the Truth Table Analysis and Large-N Survey Data: The Benefits of Calibration and the Importance of Robustness Tests.

Farmer, S.M., Tierney, P., Kung-Mcintyre, K., 2003. Employee creativity in Taiwan: an application of role identity theory. Acad. Manag. J. 46 (5), 618–630.

Fiedler, F.E., 1964. A Theory of Leader Effectiveness. McGraw-Hill, New York.

Fiss, P.C., 2007. A set-theoretic approach to organizational configurations. Acad. Manag. Rev. 32 (4), 1180–1198.

Fiss, P.C., 2011. Building better causal theories: a fuzzy set approach to typologies in organization research. Acad. Manag. J. 54 (2), 393–420.

Fiss, P.C., Cambre, B., Marx, A., 2013. Configurational Theory and Methods in Organizational Research. Emerald Group Publishing Limited, UK.

Frambach, R., Fiss, P., Ingenbleek, P.M., 2016. How important is customer orientation for firm performance? A fuzzy set analysis of orientations, strategies, and environments. J. Bus. Res. 69 (4), 1428–1436.

Friedrich, T.L., Vessey, W.B., Schuelke, M.J., Ruark, G.A., Mumford, M.D., 2009. A framework for understanding collective leadership: the selective utilization of leader and team expertise within networks. Leadersh. Q. 20 (6), 933–958.

Graen, G.B., Uhlbien, M., 1995. Relationship-based approach to leadership - development of leader-member exchange (Lmx) theory of leadership over 25 years - applying a multilevel multidomain perspective. Leadersh. Q. 6 (2), 219–247.

Hackman, J.R., 1987. The design of work teams. In: Lorsch, J.W. (Ed.), Handbook of Organizational Behavior. Prentice-Hall, Englewood Cliffs, NJ, pp. 67–102 Reading, MA. Hersey, P.

Hoch, J.E., 2013. Shared leadership and innovation: the role of vertical leadership and employee integrity. J. Bus. Psychol. 28 (2), 159–174.

House, R.J., Dessler, G., Hunt, J., Larson, L., 1974. The path goal theory of leadership: some post hoc and a priori tests. Contingency Approaches to Leadership. Southern Illinois University press, Carbondale.

Ibarra, H., 1999. Provisional selves: experimenting with image and identity in professional adaptation. Adm. Sci. Q. 44 (4), 764–791.

Lacey, R., Fiss, P.C., 2009. Comparative Organizational Analysis Across Multiple Levels: A Set-theoretic Approach. 26 pp. 91–116.

Lee, D.S., Lee, K.C., Seo, Y.W., Choi, D.Y., 2015. An analysis of shared leadership, diversity, and team creativity in an E-learning environment. Comput. Hum. Behav. 42 (SI), 47–56.

Lundin, R.A., Arvidsson, N., Brady, T., Ekstedt, E., Midler, C., Sydow, J., 2015. Managing and Working in Project Society: Institutional Challenges of Temporary Organizations. Cambridge University Press.

Marx, A., Dusa, A., 2011. Crisp-Set Qualitative Comparative Analysis (Csqca), contradictions and consistency benchmarks for model specification. Method. Innov. Online 6 (2), 103–148.

McCall, G., Simmons, J., 1978. Identities and Interaction. Free Press, New York.

Midler, C., 1995. Projectification of the firm: the Renault case. Scand. J. Manag. 11 (4), 363–375.

Miles, M.B., Huberman, A., Saldana, J., 2014. Qualitative Data Analysis. 3Rd ed. SAGE Publications Inc, USA, Thousand Oaks, CA, USA.

Müller, R., Sankaran, S., Drouin, N., Vaagaasar, A., Bekker, M.C., Jain, K., 2017a. A theory framework for balancing vertical and horizontal leadership in projects. Int. J. Proj. Manag. 36 (1), 83–94.

Müller, R., Zhu, F., Sun, X., Wang, L., Yu, M., 2017b. The identification of temporary horizontal leaders in projects: the case of China. Int. J. Proj. Manag. 36 (1), 95–107.

Nicolaides, V.C., Laport, K.A., Chen, T.R., Tomassetti, A.J., Weis, E.J., Zaccaro, S.J., Cortina, J.M., 2014. The Shared Leadership of Teams: A Meta-Analysis of Proximal, Distal, and Moderating Relationships. Leadersh. Q. 25 (5), 923–942.

Paunova, M., 2015. The emergence of individual and collective leadership in task groups: a matter of achievement and ascription. Leadersh. Q. 26 (6), 935.

Pawson, R., Greenhalgh, T., Harvey, G., Walshe, K., 2005. Realist review–a new method of systematic review designed for complex policy interventions. J. Health Serv. Res. Policy 10 (Suppl. 1), 21–34.

Pearce, C.L., 2004. The future of leadership: combining vertical and shared leadership to transform knowledge work [and executive commentary]. Acad. Manag. Execut. (1993–2005) 18 (1), 47–59.

Pearce, C., Conger, J., 2003. Shared Leadership: Reframing the Hows and Whys of Leadership. Sage, Thousand Oaks, CA.

Pearce, C.L., Sims, H.P., 2002. Vertical Versus Shared Leadership as Predictors of the Effectiveness of Change Management Teams: An Examination of Aversive, Directive, Transactional, Transformational, and Empowering Leader Behaviors, Group Dynamics: Theory, Research, and Practice. 6(2) pp. 172–197.

Petkus, E., 1996. The creative identity: creative behavior from the symbolic interactionist perspective. J. Creat. Behav. 30 (3), 188–196.

Pilkiene, M., Alonderiene, R., Chmieliauskas, A., Simkonis, S., Mueller, R., 2018. The governance of horizontal leadership in projects. Int. J. Proj. Manag. 36 (7), 913–924.

Pratt, M.G., Rockmann, K.W., Kaufmann, J.B., 2006. Constructing professional identity: the role of work and identity learning cycles in the customization of identity among medical residents. Acad. Manag. J. 49 (2), 235–262.

Ragin, C.C., 1987. The Comparative Method: Moving beyond Qualitative and Quantitative Strategies. University of California Press, Berkeley.

Ragin, C.C., 2000. Fuzzy-Set Social Science. University of Chicago Press, Chicago.

Ragin, C.C., 2006. Set relations in social research: evaluating their consistency and coverage. Polit. Anal. 14 (3), 291–310.

Ragin, C., 2007. Fuzzy sets: calibration versus measurement. In: Collier, D., Brady, H., Box, J. (Eds.), The Oxford Handbook of Political Methodology. Oxford University Press, New York, NY.

Ragin, C.C., 2008. Redesigning Social Inquiry: Fuzzy Sets and beyond. University Of Chicago Press, US.

Ragin, C.C., Davey, S., 2008. Fsqca 2.5.

Reay, T., Goodrick, E., Waldorff, S.B., Casebeer, A., 2017. Getting leopards to change their spots: co-creating a new professional role identity. Acad. Manag. J. 60 (3), 1043–1070.

Ridgeway, C.L., 2004. Status characteristics and leadership. In: van Knippenberg, D., Hogg, M.A. (Eds.), Leadership and Power : Identity Processes in Groups and Organizations. SAGE publications, London.

Rihoux, B., Ragin, C.C., 2009. Configurational Comparative Methods: Qualitative Comparative Analysis (Qca) and Related Techniques. Sage.

Riley, A., Burke, P.J., 1995. Identities and self-verification in the small-group. Soc. Psychol. Q. 58 (2), 61–73.

Saunders, M., Lewis, P., Thornhill, A., 2007. Research Methods for Business Students. Pearson Education Limited, Harlow, England.

Schneider, C.Q., Wagemann, C., 2012. Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis. Cambridge University Press, Cambridge.

Serban, A., Roberts, A., 2016. Exploring antecedents and outcomes of shared leadership in a creative context: a mixed-methods approach. Leadersh. Q. 27 (2SI), 181–199.

Serpe, R.T., Stryker, S., 2011. The symbolic interactionist the symbolic interactionist perspective and identity theory. In: Schwartz, S.J., Luyckx, K., Vignoles, V.L. (Eds.), Handbook of Identity Theory and Research. Springer, New York, pp. 225–248.

Siebert, D.C., Siebert, C.F., 2007. Help seeking among helping professionals: a role identity perspective. Am. J. Orthopsychiatry 77 (1), 49–55.

Sneed, J.R., Whitbourne, S.K., 2003. Identity Processing and Self-consciousness in Middle and Later Adulthood. 58(6) pp. P313–P319.

Stets, J.E., Burke, P.J., 2014. Emotions and identity nonverification. Soc. Psychol. Q. 77 (4), 387–410.

Stets, J.E., Cast, A.D., 2007. Resources and identity verification from an identity theory perspective. Sociol. Perspect. 50 (4), 517–543.

Stryker, S., 1980. Symbolic Interactionism: A Social Structural Version. Blackburn Press, Caldwell, NJ.

Stryker, S., 2008. From Mead to a Structural Symbolic Interactionism and Beyond. 34 pp. 15–31.

Stryker, S., Burke, P.J., 2000. The past, present, and future of an identity theory. Soc. Psychol. Q. 63 (4), 284–297.

Stryker, S., Serpe, R.T., Hunt, M.O., 2005. Making good on a promise: the impact of larger social structures on commitments. Adv. Group Process. 22 (22), 93–123.

Teddlie, C., Yu, F., 2007. Mixed methods sampling a typology with examples. J. Mixed Methods Res. 1 (1), 77–100.

Thomas, K.W., 2009. Intrinsic Motivation at Work: What Really Drives Employee Engagement. Berrett-Koehler Publishers, San Francisco.

Tierney, P., Farmer, S.M., 2002. Creative self-efficacy: its potential antecedents and relationship to creative performance. Acad. Manag. J. 45 (6), 1137–1148.

Tymon, W.G., Stumpf, S.A., Doh, J.P., 2010. Exploring talent Management in India: the neglected role of intrinsic rewards. J. World Bus. 45 (2), 109–121.

Wang, D., Waldman, D.A., Zhang, Z., Kozlowski, S.W.J.E., 2014. A meta-analysis of shared leadership and team effectiveness. J. Appl. Psychol. 99 (2), 181–198.

Wayne, S.J., Shore, L.M., Liden, R.C., 1997. Perceived organizational support and leader-member exchange: a social exchange perspective. Acad. Manag. J. 40 (1), 82–111.

Weaver, G.R., Agle, B.R., 2002. Religiosity and ethical behavior in organizations: a symbolic interactionist perspective. Acad. Manag. Rev. 27 (1), 77–97.

Wood, M., 2005. The fallacy of misplaced leadership*. J. Manag. Stud. 42 (6), 1101–1121.

Wu, Q., Cormican, K., 2016. Shared Leadership and Team Creativity: A Social Network Analysis in Engineering Design Teams. J. Technol. Manag. Innov. 11 (2), 2–12.

Yu, M., Vaagaasar, A.L., Müller, R., Wang, L.Z., Zhu, F.W., 2018. Empowerment: The Key to Horizontal Leadership in Projects. Int. J. Proj. Manag. 36 (7), 992–1006.

Yuan, F., Woodman, R.W., 2010. Innovative behavior in the workplace: the role of performance and image outcome expectations. Acad. Manag. J. 53 (2), 323–342.

Zanna, M., Cooper, J., 1976. Dissonance and the attribution process. In: Harvey, J.H., Ickes, W.J., Kidd, R.F. (Eds.), New Directions in Attribution Research, pp. 199–217 Erlbaum, Hillsdale, NJ.

Zhang, X.M., Bartol, K.M., 2010. Linking empowering leadership and employee creativity: the influence of psychological empowerment, intrinsic motivation, and creative process engagement. Acad. Manag. J. 53 (1), 107–128.

Zhang, Z., Waldman, D.A., Wang, Z., 2012. A multilevel investigation of leader-member exchange, informal leader emergence, and individual and team performance. Pers. Psychol. 65 (1), 49–78.